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A new pontoniine shrimp of the genus *Coralliocaris* Stimpson, 1860 (Crustacea: Decapoda: Palaemonidae) from the Ryukyu Islands

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Abstract.—A new species of coral-associated shrimp *Coralliocaris tridens,* is described from the Ryukyu Islands, southwestern Japan. The new species differs primarily from the eight congeneric species in having three teeth on the cutting edge of the dactylus of the second pereiopod.

In 1969, the second author carried out a field trip to Ishigaki Island, the southern Ryukyu Islands, to investigate the coral reef shrimps of the family Palaemonidae. Most of the specimens collected were then identified, but some remained unstudied. Recently, we re-examined the collection, and discovered two unusual specimens belonging to the pontoniine genus *Coralliocaris* Stimpson, 1860. The genus is composed of eight known species which are obligatory associates with scleractinian corals (Chace & Bruce 1993, Bruce 1998, Mitsuhashi 2000). Detailed examination has shown that the two specimens represent an undescribed species described herein.

The type specimens of the new species are deposited at the Kitakyushu Museum and Institute of Natural History, Kitakyushu (KMNH). The carapace length (CL), from the posterior margin of the orbit to the midpoint of the posterodorsal margin of carapace, is an indication of specimen size. The measurements and drawings were made with the aid of a drawing tube mounted on a LEICA MZ8 stereo microscope or Nikon 70021 microscope.

Coralliocaris tridens, new species
Figs. 1–3

Material examined.—Holotype: ovigerous ♀ (CL 3.05 mm), KMNH IvR 300002, Kabira Bay (24°26′N, 124°8′E), Ishigaki Island, Ryukyu Islands, southwestern Japan, from tabular coral (*Acropora* sp.), 28 Jul 1969, coll. T. Fujino. Paratype: 1 sex undet. (CL 2.06 mm), KMNH IvR 300001, same data as holotype.

Description of holotype.—Medium-sized shrimp, with typical shape for genus *Coralliocaris.* Body (Fig. 1) moderately depressed dorsoventrally. Rostrum (Figs. 1, 2A) unarmed, rather abruptly narrowed in distal half, just reaching base of intermediate segment of antennular peduncle; midrib well developed, broadened posteriorly; supraorbital eave nearly straight in dorsal view. Carapace (Figs. 1, 2A) glabrous; antennal spine submarginal; anterolateral angle broadly rounded.

Abdomen (Figs. 1, 2A) with pleura of first 3 segments broadly expanded, forming marsupium; third segment feebly produced posterodorsally, partially covering lateral surfaces of fourth and fifth segments; fourth and fifth segments each with posteroventrally rounded pleuron; sixth segment longer than fifth segment, with acute posteroventral tooth; posterolateral process blunt.

Telson (Fig. 3A) elongate, subtriangular, length about 3 times greatest width; dorsal surface with 2 pairs of small spines dorsolaterally, anterior pair situated slightly pos-

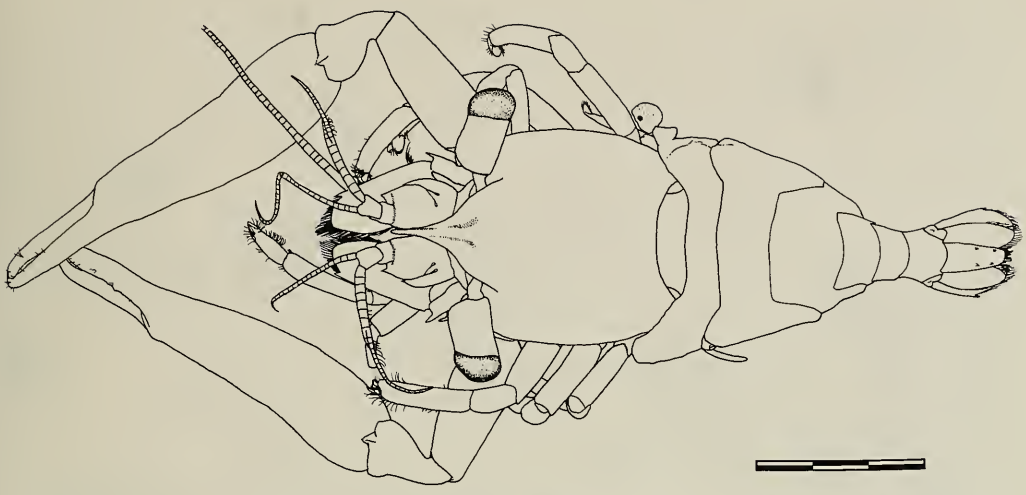

Fig. 1. *Coralliocaris tridens*, new species. Holotype (KMNH IvR 300002) ovigerous female (CL 3.05 mm). Habitus, dorsal. Scale: 3 mm.

terior to midlength of telson, posterior pair situated at about midlength between anterior pair and posterior margin; posterior margin rounded, with 3 pairs of spines, lateral pair shortest; intermediate pair longest, stout; submedian pair somewhat shorter than intermediate; simple fine seta arising from near bases of submedian and intermediate pairs of spines.

Eyes (Figs. 1, 2A) moderately large; eyestalk subcylindrical, 1.4 times as long as wide; cornea oval, slightly inflated.

Antennular peduncle (Fig. 1) reaching 0.7 of scaphocerite; basal segment broad, greatest width approximately equal to length of medial margin; ventral surface with small tooth at posterior 0.7; outer margin of stylocerite convex along general outline of basal segment, reaching level of distal 0.2 of medial margin. Intermediate segment as long as wide, with row of long plumose setae on medial margin. Distal segment weakly broadened distally; upper flagellum biramous, with proximal fused part composed of 7 articles.

Basicerite of antenna with prominent lateral spine; scaphocerite twice as long as broad, lateral margin straight, armed with stout tooth distally.

Third maxilliped with stout endopod; basis and ischiomeral segments incompletely fused; ischiomeral segment 3 times as long as basis, unarmed on lateral margin; carpus swollen medially, 1.5 times broader than terminal segment, with numerous, fine pulmose setae on medial surface; terminal segment short, teardrop-shaped, with dense plumose setae on dorsal surface; exopod almost reaching distal end of endopod; rounded epipod present; arthrobranch with 6 lamellae.

First pereiopod (Fig. 3B, C) slender, exceeding distal margin of scaphocerite by length of chela and half of carpus. Chela about half as long as carpus, gradually tapering distally; fingers half length of palm, each with entire cutting edge; palm with about 10 transverse rows of anteriorly curved, serrate setae on ventral surface. Carpus gradually widened distally, ventrodistally with transverse row of setae. Merus 3 times longer than ischium.

Second pereiopods (Fig. 1) subequal in length and shape. Chela large, elongate, somewhat compressed laterally. Dactylus about half length of palm, nearly straight in ventral view, weakly curved and distally hooked in lateral view, lacking longitudinal ridge on lateral face; cutting edge with 3 subtriangular equidistant teeth on proxi-

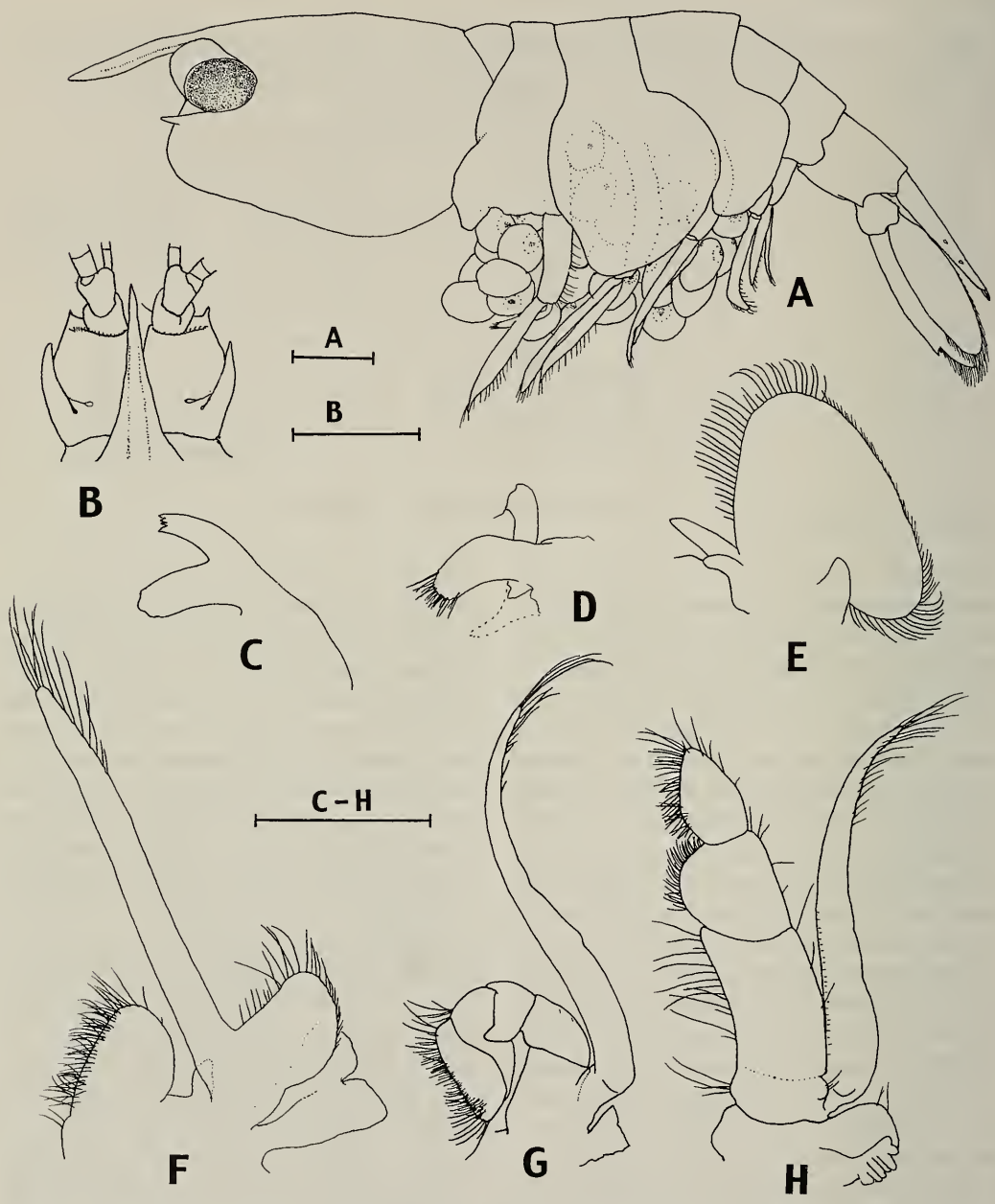

Fig. 2. *Coralliocaris tridens,* new species. A, holotype (KMNH IvR 300002) ovigerous female (CL 3.05 mm); B–H, paratype (KMNH IvR 300001), sex undet. (CL 2.06 mm). A, body, lateral, cephalic and thoracic appendages omitted; B, antennular peduncles and anterior part of rostrum, dorsal; C, left mandible, ventral; D, left maxillula, ventral, lower lacinia missing; E, left maxilla, ventral; F, left first maxilliped, ventral; G, left second maxilliped, ventral, part of epipod missing; H, left third maxilliped, ventral. Scales: 1 mm.

mal half. Fixed finger with 4 teeth, distal 3 similar to dactylar teeth, proximal tooth faintly tridenticulate; 3 shallow concavities fitting to 3 teeth on opposable margin of dactylus on slightly medial to cutting edge. Palm with weakly concave lateral profile in dorsal view. Carpus short, about 0.3 as long as palm, cup-shaped; distal margin

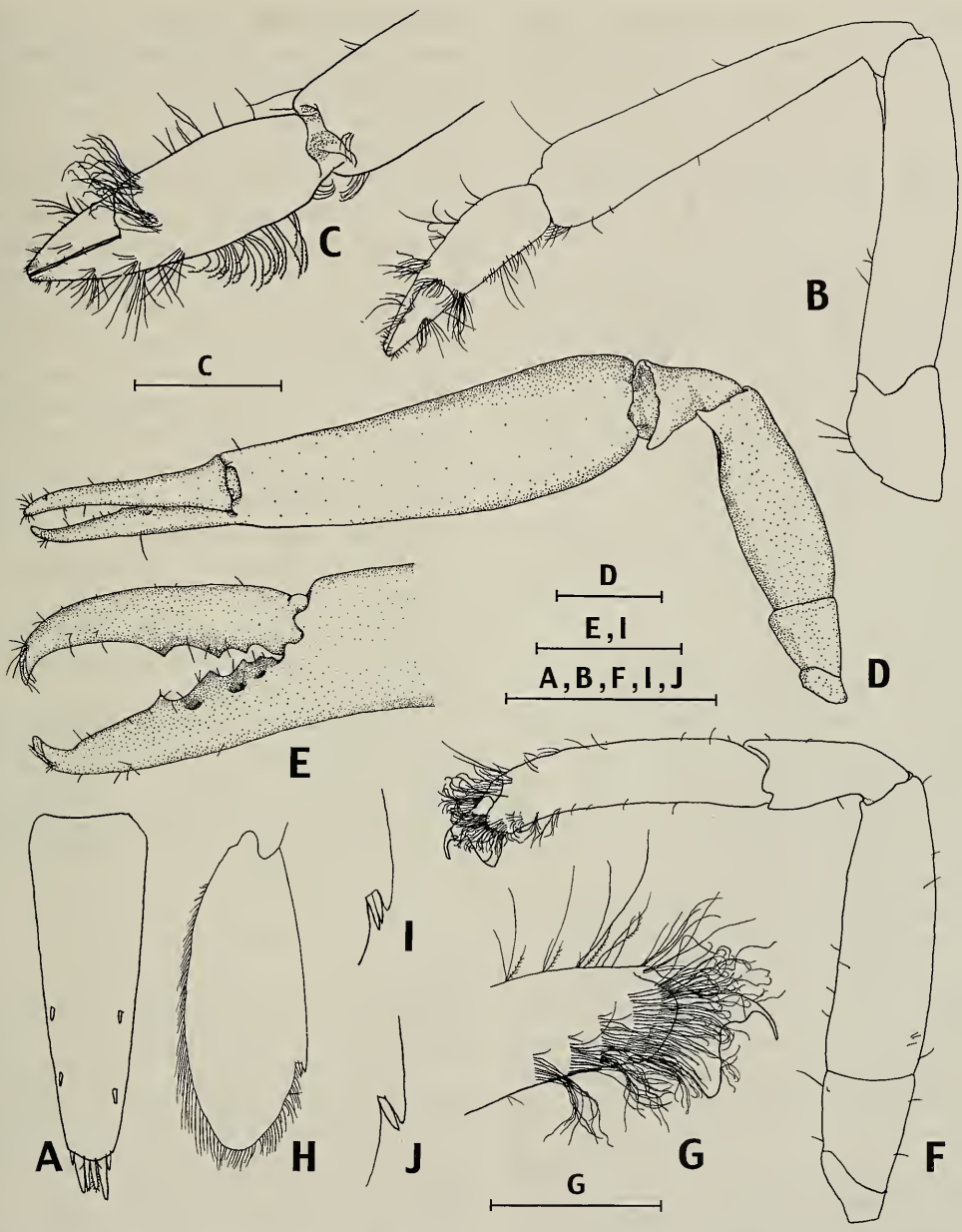

Fig. 3. *Coralliocaris tridens,* new species. A–C, H, I, holotype (KMNH IvR 300002) ovigerous female (CL 3.05 mm); D–G, J, paratype (KMNH IvR 300001), sex undet. (CL 2.06 mm). A, telson, dorsal; B, left first pereiopod, ventral; C, chela of right first pereiopod, lateral; D, left second pereiopod, ventral; E, fingers, same, medial; F, left third pereiopod, lateral; G, same, dactyl and distal part of propodus, medial; H, exopod of right uropod, dorsal; I, J, lateral part of exopod of right uropod, dorsal. Scales: 1 mm, except C and G, 0.5 mm.

with a stout process on ventral part, obscurely denticulate dorsally. Merus about half length of palm and twice as long as carpus, with moderately strong distomedial tooth. Ischium compressed, about half length of merus.

Third to fifth pereiopods similar, robust. Dactyli short, distally blunt, each with

strong acute unguis on midlength of margin of extensor surface. Propodi 4 times longer than wide, with transverse rows of dense curly setae distally. Carpi short, about half of propodi; meri subequal in length to propodi and about twice as long as carpi, slightly narrowed distally. Ischia about half as long as meri.

Pleopods normal; first pleopod without setae on surface of protopod; endopod subcylindrical, elongate, overreaching half of exopod.

Uropod (Fig. 3H, I) overreaching tip of telson; exopod with acute immovable tooth and 2 movable spines at distal 0.3 of lateral margin on both sides.

About 70 ova at early-eyed stage present, measuring 0.64–0.74 mm × 0.48–0.53 mm.

Description of paratype.—Body more slender than holotype.

Rostrum (Fig. 2B) extending to midlength of distal segment of antennular peduncle. Abdominal segments more slender than holotype, with feebly developed pleura. Antennular peduncle (Fig. 2B) with well-developed stylocerite; tip of stylocerite protruding obliquely forward from basal segment leaving v-shaped notch.

Mandible (Fig. 2C) deeply divided in incisor and molar processes, without palp; molar process slender with dense bristles distally; incisor process tapering distally, armed with 4 teeth on distomedial margin, intermediate 2 teeth somewhat smaller than outer teeth. Maxillula (Fig. 2D) with short apical seta on tip of inner lobe of palp; upper lacinia with several stout setae on distal margin. Maxilla (Fig. 2E) with short, simple endite bearing long apical seta; palp slender, feebly tapering, twice as long as endite. First maxilliped (Fig. 2F) with short non-setose palp; basial endite rounded, fringed with setae on medial margin, without distinct notch separating it from coxal endite; coxal endite with a few setae at medial margin; exopod approximately 3 times as long as basial endite, with several plumose setae distally; caridean lobe short, broad. Second maxilliped (Fig. 2G) typical for genus; dactylar segment with dorsally curved setae on medial margin; propodus not produced anteriorly, with several setae on medial margin. Third maxilliped (Fig. 2H) similar to that of holotype.

First pereiopod stouter than in holotype. Chela 0.6 times as long as carpus. Second pereiopod (Fig. 3D, E) similar to that of holotype on left side, but smaller on right side, right chela about half as long as left chela. Cutting edge of fixed finger of left chela (Fig. 3E) with most proximal tooth truncate, with 2 faintly developed denticles; dactylus of small right chela with small tooth and fixed finger with 2 small teeth. Third pereiopod (Fig. 3F, G) to fifth pereiopod slightly more slender than in holotype; propodi with dense setae distally, as in holotype.

Pleopods without specific features; endopod and exopod of first pleopod short, narrow triangular.

Posterior half of left uropod broken; right exopod (Fig. 3J) with immovable tooth and 1 spine on lateral margin.

Coloration.—The preserved specimens in spirit are uniformly whitish-cream. Color in life not recorded.

Etymology.—The specific name is a combination of the Latin, *tri* (=three) and *dens* (=tooth), in reference to the characteristic three teeth on the cutting edge of the dactylus of the second pereiopod.

Distribution.—Known so far only from Kabira, Ishigaki Island, Ryukyu Islands.

Host.—The host coral is an unidentified species of *Acropora,* like in most of *Coralliocaris* species (Bruce 1972, 1977).

Remarks.—The sex of the paratype could not be determined, because the appendix masculina is not differentiated.

Coralliocaris tridens, new species, is readily distinguished from the other species of *Coralliocaris* by having three teeth on the cutting edge of dactylus of the second pereiopod. The cutting edge of the dactylus of the second pereiopod is armed with two teeth in *C. brevirostris* Borradaile, 1898, *C. nudirostris* (Heller, 1861) and *C. venusta*

Kemp, 1922, and with one blunt projection in *C. superba* Dana, 1852 and *C. taiwanensis* Fujino & Miyake, 1972. In *C. graminea* Dana, 1852, *C. viridis* Bruce, 1974 and *C. macrophthalma* (H. Milne Edwards, 1837), the cutting edge of the dactylus of the second pereiopod is unarmed, bearing a fossa in which fits a flattened tooth on the opposable margin (Chace & Bruce 1993, Bruce 1998, Mitsuhashi 2000). The armature of the dactylus is constant and without doubt one of the important character to distinguish the species.

Coralliocaris tridens is most similar to *C. nudirostris* in having unarmed rostrum, triangular teeth on the cutting edges of fingers of the second pereiopods, and straight subdistal part at the cutting edges of the fixed finger of the second pereiopod. We fortunately could examine the type specimens of *C. nudirostris* in the collections of the Natural History Museum in Vienna and found that the dactylus of the second pereiopod bears a longitudinal ridge on its medial surface, and differs from that of *C. tridens,* in which the medial surface is not ridged and smooth (Fig. 3E).

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